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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,462	06/23/2003	Daniel Wayne Bedell	HIT1P006/HSJ9-2003-0045US	2629

50535 7590 09/26/2007

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EXAMINER	
CHEN, TIANJIE	
ART UNIT	**PAPER NUMBER**
2627	

MAIL DATE	DELIVERY MODE
09/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/602,462	BEDELL ET AL.	
	Examiner	Art Unit	
	Tianjie Chen	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Final Rejection (RCE)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 25-32 and 34-45, and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US 6,757,133) in view of Sasaki et al (US 6,801,407).

Claim 25, Sato shows a magnetic head in Fig. 2, including:

an underlying layer 32, the underlying layer being made of alumina, which is electrically insulating (Column 7, line 62),

a polyimide layer 39 (Column 8, lines 42-44) positioned adjacent the underlying layer and having two opposing sides defining a channel around 34a; and

a coil structure 34a formed of a conductive material (Column 8, lines 17-18 and 6-9) situated in the channel, a bottom of the channel extending between the opposing sides and both sides being defined by the underlaying layer;

wherein a profile of each of the sides of the polyimide layer that define the channel includes a first segment and a second segment that is contiguous with the first segment, the first segment defining a first angle relative to a plane of deposition of the polyimide layer, the second segment defining a second angle relative to the plane of deposition of the insulating layer, the second angle being different than the first angle,

wherein the first segment of each side of the polyimide layer is positioned below the second segment located contiguously thereto,

wherein height of the first segment of each side of the polyimide layer measured perpendicular to the plane of deposition of the polyimide layer extends from the underlying layer to a point between 20% and 80% of a total channel height from a top of the channel.

Sato does not show that the layer 39 is a photoresist layer.

Sasaki shows a magnetic head and teaches in claim 54 that photoresist and polyimide are alternatives for forming an insulating layer. It is also well known in the art that photoresist is commonly used in the magnetic head as an insulating material. One of ordinary skill in the art would have been motivated to include photoresist as an alternative for insulating layer to increase feasibility in design.

Claim 26, Sato further shows in fig. 2 that the height of the first segment of each side of the photoresist layer is greater than a height of the second segment located contiguously thereto.

Claim 27, Sato further shows in Fig. 2 that the first segment of the sides of the photoresist layer taper together towards the underlying layer.

Claim 28, Sato shows in Fig. 2 that the first segment defines an angle between 70 and 85 degrees relative to the plane of deposition of the photoresist layer.

Claim 29, Sato further shows in Fig. 2 that the second segment defines an angle that is substatltially perpendicular to the plane of deposition of the photoresist layer.

Claim 30, Sato shows in Fig. 2 that the second segment defines an angle between 80 and 90 degrees relative to the plane of deposition of the photoresist layer.

Claim 31, Sato shows that the first segment defines an angle between 70 and 85 degrees relative to the plane of deposition of the photoresist layer.

Claim 32, Rose et al further shows a magnetic head.

A "product by process" claim is directed to the product per se, no matter how actually made, see In re Hirao, 190 USPQ 15 at 17 (footnote 3 CCPC, 5/27/76); In re Brown, 173 USPQ 685 (CCPA 5/18/72); In re Luck, 177 USPQ 523 (CCPA, 4/26/73); In re Fessmann, 180 USPQ 324 (CCPA, 1/10/74); In re Thorpe, 227 USPQ 964 (CAFC, 11/21/85). The patentability of the final product in a "product by process" claim must be determined by the product itself and not the actual process and an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. In claim 32, "the reactive ion etching includes H_2/N_2/ $H_2/CH_3F/C_2H_4$ reducing chemistry" is a process related limitation, which gains no weight in determining patentability.

Claim 34, Sato shows that the conductive material includes Cu (Column 8, lines 5-10 and 17-18).

Claim 35, Sato shows in Fig. 2 that an aspect ratio, the ratio of the height to the width of the bottom, of the channel and coil structure is at least 2.5.

Claim 36, as described above, Sato and Sasaki show a magnetic head including:

an underlying layer, the underlying layer being electrically insulating;

a photoresist layer positioned adjacent the underlying layer and having two opposing sides defining a channel; a bottom of the channel extending between the opposing sides and both sides being defined by the underlying layer; and

a coil structure formed of a conductive material situated in the channel,

wherein a profile of each of the sides of the photoresist layer that define the channel includes a first segment and a second segment that is contiguous with the first segment, the first segment defining a first angle relative to a plane of deposition of the photoresist layer, the second segment defining a second angle being different than the first angle

wherein the first segment of each side of the photoresist layer is positioned below the second segment located contiguously thereto,

wherein height of the first segment of each side of the photoresist layer measured perpendicular to the plane of deposition of the photoresist layer extends from the underlying layer to a plant between 20% and 80% of a total channel height from a top of the channel;

wherein the first segment of the sides of the photoresist layer taper together towards the underlying layer.

wherein the second segment defines an angle, between 80 and 90 degrees relative m the plane of deposition of the photoresist layer;

wherein the first segment defines an angle between 70 and 85 degrees relative to the plane of deposition of the photoresist layer.

Claim 37, Sato shows a magnetic head for an inherent disk drive system, including a magnetic recording disk; the magnetic head in Fig. 12, including:

a magnetic head including: an insulating layer 11 (Column 1, line 48),

a insulating layer 14 (Column 1, line 58) positioned adjacent the insulating layer, the insulating layer 14 having opposing sides defining at least one channel, and

a coil structure 18 (Column 2, line 8) defined by a conductive material situated in the channel,

wherein each of the sides of the insulating layer 14 includes a first segment defining a first angle and a second segment defining a second angle, the first and second segments being contiguous;

wherein a height of the first segment measured perpendicular to the plane of deposition of the photoresist lager extends from the insulating layer to a point between 20% and 80% of a total channel height from a top of the channel;

wherein the insulating layer 14 does not overlay the coil structure 18;

and an inherent actuator for moving the magnetic head across the magnetic recording disk so the magnetic head may access different regions of the magnetic recording disk; and

an inherent controller electrically coupled to the magnetic head.

Sato does not show that the layer 14 is a photoresist layer.

Sasaki shows a magnetic head and teaches in claim 54 that photoresist and polyimide are alternatives for forming an insulating layer. It is also well known in the art that photoresist is commonly used in the magnetic head as an insulating material. One of ordinary skill in the art would have been motivated to include photoresist as an alternative for insulating layer to increase feasibility in design.

Claim 38, Sato shows a magnetic head in Fig. 10, including:

an insulating layer 11;

a insulating layer 14 positioned adjacent the insulating layer for defining at least one channel; and

a coil structure 18+12a defined by a conductive material situated in the at least one channel, wherein the insulating layer does not overlay the coil structure;

wherein a profile of the channel includes a first segment (filled with 18) defining a first angle relative to a plane of deposition of the insulating layer, and a second segment (filled with 12a) continuous with the first segment, the second segment defining a second angle relative to a plane of deposition of the insulating layer, the second angle being different than the first angle.

Sato does not show that the layer 14 is a photoresist layer.

Sasaki shows a magnetic head and teaches in claim 54 that photoresist and polyimide are alternatives for forming an insulating layer. It is also well known in the art that photoresist is commonly used in the magnetic head as an insulating material. One of ordinary skill in the art would have been motivated to include photoresist as an alternative for insulating layer to increase feasibility in design.

Claim 39, Sato shows in fig. 12 that the height of the first segment of each side of the photoresist layer is greater than a height of the second segment located contiguously thereto.

Claim 40, Sato shows in Fig. 12 that the first segment of each of the opposing sides of the photoresist layer taper together towards the underlying layer.

Claim 41, Sato shows in Fig. 12 that the first segment defines an angle between 70 and 85 degrees relative to the plane of deposition of the photoresist layer.

Claim 42, Sato shows that the second segment defines an angle that is substantially perpendicular to the plane of deposition of the photoresist layer.

Claim 43, Sato shows that the second segment defines an angle between 80 and 90 degrees relative to the plane of deposition of the photoresist layer.

Claim 44, Sato shows that the first segment defines an angle between 70 and 85 degrees relative to the plane of deposition of the photoresist layer.

Claim 45 is rejected for the same reason as for claim 32.

Claim 47, Sato shows that the conductive material includes Cu.

Claim 48, Sato shows in Fig. 10 that an aspect ratio of the channel and coil structure is at least 2.5.

Claim 50, Sato shows in Fig. 10 that the layer of photoresist does not overlay the coil structure.

Claim 49/25, Sato shows a magnetic head in Fig. 10, including:

an underlying layer 11, the underlying layer being electrically insulating,

a insulating layer positioned adjacent the underlying layer and having two opposing sides defining a channel around 18; and

a coil structure 18 formed of a conductive material situated in the channel, a bottom of the channel extending between the opposing sides and both sides being defined by the underlaying layer;

wherein a profile of each of the sides of the photoresist layer that define the channel includes a first segment and a second segment that is contiguous with the first segment, the first segment defining a first angle relative to a plane of deposition of the polyimide layer, the second segment defining a second angle relative to the plane of deposition of the insulating layer, the second angle being different than the first angle,

wherein the first segment of each side of the insulating layer is positioned below the second segment located contiguously thereto,

wherein height of the first segment of each side of the insulating layer measured perpendicular to the plane of deposition of the insulating layer extends from the

underlying layer to a point between 20% and 80% of a total channel height from a top of the channel.

Sato does not show that the layer 14 is a photoresist layer.

Sasaki shows a magnetic head and teaches in claim 54 that photoresist and polyimide are alternatives for forming an insulating layer. It is also well known in the art that photoresist is commonly used in the magnetic head as an insulating material. One of ordinary skill in the art would have been motivated to include photoresist as an alternative for insulating layer to increase feasibility in design.

Sato further shows in Fig. 10 that the layer of photoresist 14 does not overlay the coil structure.

2. Claims 33 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Sasaki et al as applied to claim 25 above, and further in view of Rose (US 2001/0013991).

Claims 33 and 46, Sasaki shows that the insulating layer is made of photoresist but does not show if it is hard-baked or not.

Rose et al shows that the photoresist is hard-baked ([0046] lines 1).

The process related limitation gains no weight in determining patentability for the same reason described above.

Response to Arguments

3. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is 571-272-7570. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TIANJIE CHEN
PRIMARY EXAMINER